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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,666	07/16/2003	Ulrich E. Hess	200312614-1	8645

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EXAMINER

AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/620,666

Applicant(s)

HESS ET AL.

Examiner

Shamim Ahmed

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

*R*

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election of Group II, claims 19-34 in the reply filed on March 08, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (532,530) in view of Kang et al (6,287,965).

Hawkins discloses a method of fabrication a printing head or fluid ejecting device, wherein a tantalum layer (46) is deposited as a protection layer, which resembles the claimed cavitation layer (col.5, lines 34-37 and figure 4A).

Hawkins remain silent regarding the deposition of the tantalum layer, and specifically fails to teach that the tantalum layer is formed by using an atomic layer deposition process.

However, Kang et al teach a process of deposition metal layer such as tantalum utilizing atomic layer deposition process with excellent thermal and oxidation resistant characteristics of the deposited layer (col.2, lines 6-17 and abstract).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Kang et al's teaching into Hawkins's process for efficiently depositing the cavitating tantalum layer with excellent thermal and oxidation resistant characteristics as taught by Kang et al.

5. Claims 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Figueredo et al (5,883,650) in view of Lindfors et al (4,488,084) and further in view of Kang et al (6,287,965).

Figueredo et al disclose a process of making a print head or fluid ejecting device, wherein a plurality of layers are formed over a substrate including dielectric layer (14) (col.4, lines 16-28).

Figueredo et al disclose that a thin film technology is utilized to form thin film structure (30) including resistive material (18), passivation layer (26) and cavitation layer (32) and firing chamber or orifice plate (8) is disposed over print head for ejecting ink through nozzle (25), wherein all the layers in the thin film structure (30) are formed by conventional sputtering (col.5, lines 1-43).

Figueredo et al fail to teach the deposition is performed using atomic layer deposition.

However, in a method of thin-forming process, Lindfors et al teach that the thin-film forming technology includes atomic layer deposition such as atomic layer epitaxy (ALE) and the insulating layer (5) is formed utilizing thin-film forming technology such as ALE (col.2, lines 42-45).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to modify Figueredo et al's process with the teaching of Lindfors et al for reasonable expectation of success as evidenced by Kang et al.

Kang et al teach that atomic layer deposition has excellent step coverage than the conventional sputtering process including injecting other gases with the source gas (col.1, lines 65-col.2, lines 13 and col.5, lines 1-22).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Kang et al's teaching into modified Figueredo et al's process for efficiently depositing layers with excellent step coverage and as well as excellent thermal and oxidation resistant characteristics as taught by Kang et al.

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6. Claims 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoffel (4,862,197) in view of Lindfors et al (4,488,084) and further in view of Kang et al (6,287,965).

Stoffel teaches a process of making a print head including the steps of forming a plurality of layers (12,14) over a substrate 10 (col. 3, lines 22-34).

Stoffel teaches forming a plurality of dielectric layer comprises silicon nitride (24) and silicon carbide (26) over the plurality of layers for good insulation and protection against cavitation wear and ink resistance (col.3, lines 61-68).

Stoffel fails to teach that using an atomic layer deposition process forms the insulation layer.

However, in a method of thin-forming process, Lindfors et al teach that the thin-film forming technology includes atomic layer deposition such as atomic layer epitaxy (ALE) and the insulating layer (5) is formed utilizing thin-film forming technology such as ALE (col.2, lines 42-45).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to modify Stoffel's process with the teaching of Lindfors et al for reasonable expectation of success as evidenced by Kang et al.

Kang et al teach that atomic layer deposition has excellent step coverage than the conventional sputtering process (col.1, lines 65-col.2, lines 13).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to combine Kang et al's teaching into modified Stoffel's

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process for efficiently depositing layers with excellent step coverage and as well as excellent thermal and oxidation resistant characteristics as taught by Kang et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed  
Primary Examiner  
Art Unit 1765

SA  
March 26, 2005